an engine dynamometer (for engines producing primarily shaft power) or thrust measuring test stand (for engines producing primarily thrust). The exhaust gases generated during engine operation must be sampled continuously for specific component analysis through the analytical train.

(c) The exhaust emission test is designed to measure concentrations of hydrocarbons, carbon monoxide, carbon dioxide, and oxides of nitrogen, and to determine mass emissions through calculations during a simulated aircraft landing-takeoff cycle (LTO). The LTO cycle is based on time in mode data during high activity periods at major airports. The test for propulsion engines consists of at least the following four modes of engine operation: taxi/idle, takeoff, climbout, and approach. The mass emission for the modes are combined to yield the reported values.

(d) When an engine is tested for exhaust emissions on an engine dynamometer or test stand, the complete engine (with all accessories which might reasonably be expected to influence emissions to the atmosphere installed and functioning), shall be used if not otherwise prohibited by §34.62(a)(2). Use of service air bleed and shaft power extraction to power auxiliary, gearbox-mounted components required to drive aircraft systems is not permitted.

(e) Other gaseous emissions measurement systems may be used if shown to yield equivalent results and if approved in advance by the Administrator or the Administrator of the EPA.

[Doc. No. 25613, 55 FR 32861, Aug. 10, 1990, as amended by Amdt. 34–3, 64 FR 5559, Feb. 3, 1999]

§34.61 Turbine fuel specifications.

For exhaust emission testing, fuel that meets the specifications listed in this section shall be used. Additives used for the purpose of smoke suppression (such as organometallic compounds) shall not be present.

SPECIFICATION FOR FUEL TO BE USED IN AIRCRAFT TURBINE ENGINE EMISSION TESTING

Property	Allowable range of values
Density at 15 °C	780–820.
Distillation Temperature, °C 10% Boiling Point.	155–201.
Final Boiling Point	235–285.
Net Heat of Combustion, MJ/Kg	42.86–43.50.
Aromatics, Volume %	15–23.
Naphthalenes, Volume %	1.0–3.5.
Smoke point, mm	20–28.
Hydrogen, Mass %	13.4–14.1.
Sulfur Mass %	Less than 0.3%.
Kinematic viscosity at—20 °C, mm^2/sec	2.5–6.5.

[Doc. No. FAA–1999–5018, 64 FR 5559, Feb. 3, 1999]

§34.62 Test procedure (propulsion engines).

(a)(1) The engine shall be tested in each of the following engine operating modes which simulate aircraft operation to determine its mass emission rates. The actual power setting, when corrected to standard day conditions, should correspond to the following percentages of rated output. Analytical correction for variations from reference day conditions and minor variations in actual power setting should be specified and/or approved by the Administrator:

Mode	Class		
	TP	TF, T3, T8	TSS
Taxi/idle	(*)	(*)	(*)
Takeoff	100	100	100
Climbout	90	85	65
Descent	NA	NA	15
Approach	30	30	34

*See paragraph (a) of this section.

(2) The taxi/idle operating modes shall be carried out at a power setting of 7% rated thrust unless the Administrator determines that the unique characteristics of an engine model undergoing certification testing at 7% would result in substantially different HC and CO emissions than if the engine model were tested at the manufacturers recommended idle power setting. In such cases the Administrator shall specify an alternative test condition.

(3) The times in mode (TIM) shall be as specified below: